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**Vodniki za nadzemne vode – Oblikovane žice, koncentrična lega, pletene vrvi**

Overhead electrical conductors - Formed wire, concentric lay, stranded conductors

Leiter für elektrische Freileitungen - Leiter aus Formdrähten mit konzentrisch verseilten Lagen

Conducteurs pour lignes électriques aériennes - Conducteurs à fils de forme, câblés en couches concentriques

**STANDARD PREVIEW**  
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Ta slovenski standard je istoveten z: **SIST EN 62219:2002** **EN 62219:2002**

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**ICS:**

29.060.01	Električne žice in kabli na splošno	Electrical wires and cables in general
29.240.20	Daljnovodi	Power transmission and distribution lines

**SIST EN 62219:2002****en**

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EUROPEAN STANDARD

**EN 62219**

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2002

ICS 29.060;29.240.20

English version

**Overhead electrical conductors -  
Formed wire, concentric lay, stranded conductors  
(IEC 62219:2002)**

Conducteurs pour lignes  
électriques aériennes -  
Conducteurs à fils de forme,  
câblés en couches concentriques  
(CEI 62219:2002)

Leiter für elektrische Freileitungen -  
Leiter aus Formdrähten  
mit konzentrisch verseilten Lagen  
(IEC 62219:2002)

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This European Standard was approved by CENELEC on 2002-05-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

## CENELEC

European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**Central Secretariat: rue de Stassart 35, B - 1050 Brussels**

## Foreword

The text of document 7/539/FDIS, future edition 1 of IEC 62219, prepared by IEC TC 7, Overhead electrical conductors, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62219 on 2002-05-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2003-02-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2005-05-01

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annexes A, B, C and ZA are normative and annex D is informative.

Annex ZA has been added by CENELEC.

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## Endorsement notice

The text of the International Standard IEC 62219:2002 was approved by CENELEC as a European Standard without any modification.

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## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-466	1990	International electrotechnical vocabulary (IEV) - Chapter 466: Overhead lines	-	-
IEC 60104	1987	Aluminium-magnesium-silicon alloy wires for overhead line conductors	-	-
IEC 60888	1987	Zinc-coated steel wires for stranded conductors	-	-
IEC 60889	1987	Hard-drawn aluminium wire for overhead line conductors	EN 60889	1997
IEC 61089	1991	Round wire concentric lay overhead electrical stranded conductors	-	-
IEC 61232 (mod)	1993	Aluminium-clad steel wires for electrical purposes	EN 61232 + A11	1995 2000
IEC 61395	1998	Overhead electrical conductors - Creep test procedures for stranded conductors	EN 61395	1998

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NORME  
INTERNATIONALE  
INTERNATIONAL  
STANDARD

CEI  
IEC

62219

Première édition  
First edition  
2002-02

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aériennes –  
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International Electrotechnical Commission  
Международная Электротехническая Комиссия

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**OVERHEAD ELECTRICAL CONDUCTORS –  
FORMED WIRE, CONCENTRIC LAY, STRANDED CONDUCTORS**
**FOREWORD**

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62219 has been prepared by IEC technical committee 7: Overhead electrical conductors.

The text of this standard is based on the following documents:

FDIS	Report on voting
7/539/FDIS	7/540/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

Annexes A, B and C form an integral part of this standard.

Annex D is for information only.

The committee has decided that the contents of this publication will remain unchanged until 2007. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

## OVERHEAD ELECTRICAL CONDUCTORS – FORMED WIRE, CONCENTRIC LAY, STRANDED CONDUCTORS

### 1 Scope

This International Standard specifies the electrical and mechanical characteristics of concentric lay, overhead conductors of wires formed or shaped before, during or after stranding, made of combinations of any of the following metal wires:

- a) hard aluminium as per IEC 60889 designated A1;
- b) hard aluminium as per IEC 60889 designated A1F wire shaped before stranding;
- c) hard aluminium alloy as per IEC 60104 designated A2 or A3;
- d) hard aluminium alloy as per IEC 60104 designated A2F or A3F shaped before stranding;
- e) regular strength steel, designated S1A or S1B, where A and B are zinc coating classes, corresponding respectively to classes 1 and 2;
- f) high strength steel, designated S2A or S2B;
- g) extra high strength steel, designated S3A;
- h) aluminium clad steel, designated SA.

The following are examples of some possible conductor designations. Other combinations are also permitted.

- A1F, A2F, A3F
- A1F/S1A, A1F/S1B, A1F/S2A, A1F/S2B, A1F/S3A
- A1F/A1, A1F/A2, A1F/A3
- A1F/SA, A2F/SA, A3F/SA

Other possible conductor types not included above are not specifically excluded.

### 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050(466):1990, *International Electrotechnical Vocabulary – Chapter 466: Overhead lines*

IEC 60104:1987, *Aluminium-magnesium-silicon alloy wire for overhead line conductors*

IEC 60888:1987, *Zinc-coated steel wires for stranded conductors*

IEC 60889:1987, *Hard-drawn aluminium wire for overhead line conductors*

IEC 61089:1991, *Round wire concentric lay overhead electrical stranded conductors*

IEC 61232:1993, *Aluminium-clad steel wires for electrical purposes*

IEC 61395:1998, *Overhead electrical conductors – Creep test procedures for stranded conductors*

### 3 Definitions

For the purpose of this International Standard the following definitions apply:

#### 3.1

##### **aluminium**

all types of aluminium and aluminium alloys listed

#### 3.2

##### **conductor**

material intended to be used for carrying electric current consisting of a plurality of uninsulated wires twisted together

[IEV 466-01-15 modified]

#### 3.3

##### **concentric lay stranded conductor**

conductor composed of a central core surrounded by one or more adjacent layers of wires being laid helically in opposite directions

#### 3.4

##### **direction of lay**

##### 3.4.1

##### **direction of lay (general definition)**

direction of twist of a layer of wires as it moves away from the viewer

NOTE A right-hand lay is a clockwise direction and a left-hand lay is an anti-clockwise direction.

[IEV 466-10-07 modified]

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##### 3.4.2

##### **direction of lay (alternative definition)**

the direction of lay is defined as right-hand or left-hand

NOTE With right-hand lay, the wires conform to the direction of the central part of the letter Z when the conductor is held vertically. With left-hand lay, the wires conform to the direction of the central part of the letter S when the conductor is held vertically.

#### 3.5

##### **equivalent wire diameter**

the diameter of a round wire which would have the same cross-sectional area, mass and electrical resistance as a given formed wire of the same material

#### 3.6

##### **compactness ratio**

$\text{area 1}/\text{area 2}$  – where area 1 is the total cross-sectional area of the conductor including the core and area 2 is the area of a circle with diameter equal to the conductor outside diameter

#### 3.7

##### **fill ratio**

$\text{area 1}/(\text{area 2} - \text{area 3})$  – where area 1 is the cross-sectional area of the aluminium portion of the conductor, area 2 is the area of a circle of diameter equal to the conductor outside diameter and area 3 is the area of a circle circumscribing the core of a composite conductor (0 for a homogeneous conductor)

**3.8****formed wire**

filament of metal having a constant cross-section and a non-circular shape

**3.9****lay length**

axial length of one complete turn of the helix formed by an individual wire in a stranded conductor

**3.10****lay ratio**

ratio of the lay length to the external diameter of the corresponding layer of wires in the stranded conductor

[IEV 466-10-06 modified]

**3.11****lot**

group of conductors manufactured by the same manufacturer under similar conditions of production

NOTE A lot may consist of part or all of the purchased quantity.

**3.12****nominal**

name or identifying value of a measurable property by which a conductor or component of a conductor is identified and to which tolerances are applied

NOTE Nominal values should be target values.

**3.13****round wire**

filament of drawn metal having a constant circular cross-section

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**3.14****steel ratio**

the ratio of steel area to aluminium area as a percentage in AxF/Syz conductors

**4 Designation system**

A designation system is used to identify stranded conductors made of formed aluminium, with or without steel wires.

Homogeneous aluminium conductors are designated AxF, where x identifies the type of aluminium.

Composite aluminium conductors are designated AxF/Ay or AxF/AyF, where AxF identifies external wires (or the envelope) and Ay or AyF identifies internal wires (or the core).

Composite aluminium-steel conductors are designated AxF/Syz or AxF/SA, where AxF identifies the external aluminium wires (envelope), and Syz or SA identifies the steel core. In the designation of zinc coated steel wires, y represents the type of steel (regular, high or extra high strength) and z represents the class of zinc coating (A or B).

Conductors are identified as follows:

- a) a code number giving the equivalent conductive section of A1F aluminium expressed in mm<sup>2</sup>;
- b) a code number giving the area of the core material in mm<sup>2</sup>, if used;